

IN THE CLAIMS:

1. (Previously Presented) An apparatus for applying ultrasonic vibration to a resin material which applies the ultrasonic vibration to the resin material in a molten state, the apparatus comprising:

a vibrator which applies ultrasonic vibration to a resin material, or a vibration transmission member which transmits vibration of the vibrator to a resin material,

wherein the vibrator or the vibration transmission member has high adhesive properties to the resin material, the vibrator or the vibration transmission member is located in a channel of a flowing molten resin material in contact with the resin material and the vibrator or the vibration transmission member is positioned to transmit vibration in a direction perpendicular to a flow direction of the flowing molten resin material; and

vibration transmission inhibition means is positioned to substantially inhibit members other than the resin material from being vibrated by the vibration of the vibrator or the vibration transmission member.

2. - 3. (Canceled).

4. (Previously Presented) The apparatus for applying the ultrasonic vibration to the resin material according to claim 1, wherein the vibration transmission inhibition means is an elastic member interposed between the vibrating member or the vibration transmission member and the other member.

5. (Previously Presented) The apparatus for applying the ultrasonic vibration to the resin material according to claim 4, wherein a connecting portion which connects the vibrating member or the vibration transmission member to the other member is progressively formed in a position corresponding to a node portion of the vibration transmitted inside the vibrating member or the vibration transmission member, and the elastic member is interposed between the connecting portion and the other member.

6. (Previously Presented) The apparatus for applying the ultrasonic vibration to the resin material according to claim 4, wherein $E < 0.3E_h$ is satisfied wherein E_h is an elasticity of the vibrating member or the vibration transmission member, and E is an elasticity of the elastic member.

7. (Previously Presented) The apparatus for applying the ultrasonic vibration to the resin material according to claim 1, wherein the vibration transmission inhibition means is a gap interposed between the vibrating member or the vibration transmission member and the other member.

8. (Previously Presented) The apparatus for applying the ultrasonic vibration to the resin material according to claim 7, wherein a size of the gap is set to 0.05 mm or more and 0.5 mm or less.

9. (Currently Amended) The apparatus for applying the ultrasonic vibration to the resin material according to claim 1, wherein a vibration-applied surface, on which the vibrating member or the vibration transmission member contacts the resin material to apply the vibration thereto, ~~is a processed and/or~~ has been treated surface to improve the adhesive properties of the vibrator or the vibration transmission member to the resin material.

10. (Currently Amended) The apparatus for applying the ultrasonic vibration to the resin material according to claim 9, wherein the ~~processed and/or treated surface is processed and/or~~ has been treated through formation of concave/convex portions or grooves, plating, coating of an adhesive properties improver, flame spraying, or a combination of them.

11. (Previously Presented) The apparatus for applying the ultrasonic vibration to the resin material according to claim 10, wherein the adhesive properties improver is maleic anhydride or a composition of malefic acid.

12. (Previously Presented) The apparatus for applying the ultrasonic vibration to the resin material according to claim 1, wherein the vibrator or the vibration transmission member is a horn having any shape of a columnar shape, plate shape, ring shape, circular cone shape, truncated cone shape, conical shape, exponential shape, rectangular parallelepiped shape, cube shape, and a shape in which a slit, cut or flange is formed on any one of these shapes.

13. (Previously Presented) The apparatus for applying the ultrasonic vibration to the resin material according to claim 12, wherein a plurality of horns are arranged in series or in parallel along the channel.

14. (Previously Presented) The apparatus for applying the ultrasonic vibration to the resin material according to claim 12, wherein a plurality of horns are arranged around the channel, and the vibration is applied to the resin material from different directions.

15. (Previously Presented) The apparatus for applying the ultrasonic vibration to the resin material according to claim 1, wherein the channel is formed in one of a cylinder of an extrusion machine or an injection molding machine, a cylinder of an extruder or a kneader, a chamber, a downstream side from an outlet of the cylinder, and a mold.

16. (Previously Presented) The apparatus for applying the ultrasonic vibration to the resin material according to claim 1, wherein the resin material is one of a mixture of two or more resins and/or elastomers, and a mixture of a resin and/or an elastomer and a filler.

17. (Previously Presented) A method of kneading, compounding and blending a resin material, comprising the steps of:

disposing the ultrasonic vibration applying apparatus according to claim 1 in a channel through which the resin material having a molten state flows; and

applying the ultrasonic vibration to the resin material which flows through the channel from a direction crossing a flow direction of the resin material at right angles;

the application of the ultrasonic vibration through the vibrator or the vibration transmission member being performed under conditions that members other than the vibrator or the vibration transmission member are not substantially vibrated.

18. (Previously Presented) A resin composition produced by use of the ultrasonic vibration applying apparatus according to claim 1.

19. (Original) The resin composition according to claim 18, which is produced by mixing two or more thermoplastic resins and/or elastomers, wherein an interface is formed between the mixed thermoplastic resins, and one thermoplastic resin oozes like a feather into the other thermoplastic resin in the interface.

20. (New) The apparatus for applying the ultrasonic vibration to the resin material according to claim 16, wherein the resin material includes maleic anhydride or a resin modified by maleic anhydride.

21. (New) The apparatus for applying the ultrasonic vibration to the resin material according to claim 9, wherein the surface has been treated through sand-blasting.